

## Note on the Value of Sea Weeds - as Manure †

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It is well known that sea-weeds are valuable as manure for agricultural crops besides the importance of certain varieties as food and as raw-materials for the extraction of agar agar. In Madras Presidency sea-weeds are washed ashore on the coasts of Palk-Strait and Gulf of Mannar during the period from May to October. The chief varieties of sea-weeds washed ashore are: *Gracillaria spp.*, *Sargassum spp.*, and *Turbinaria sp.* Though accurate statistics of the quantity of sea-weeds washed ashore are not available at present, it may be of interest here to point out that the quantity of sea-weeds washed in the jurisdiction\* of the three Fish Curing Yards, Sethubhavachathram, Idinthakarai and Ovari, during the year (July, 1944 to June 1945) amounted to 120 tons. This will indicate a comparative idea of the abundance of sea-weeds washed ashore in the Coast line, from Pt. Calimere to Cape Comorin — a distance of about 250 miles.

Samples of *Gracillaria spp.*, *Sargassum spp.* and *Turbinaria sp.* were collected from the shores of Krusadai Island, Gulf of Mannar in August, 1944 and they were sent to the Agricultural Chemist for testing their manurial value. The analysis shows that the three varieties of sea-weeds contain fairly large quantities of nitrogen and that *Sargassum* and *Turbinaria* are also rich in Potash. Of the three, *Gracillaria* is rich in nitrogen but very low in phosphoric acid and potash content. *Turbinaria* has a high potash content and low nitrogen content, and *Sargassum* is intermediate in potash and nitrogen content. The following table gives the result of the analysis:—

	Moisture in air dry sample	Loss on ignition	In- solubles	Solubles	Nitrogen	Potash	Phos- phoric acid
<i>Gracillaria</i> ...	10.71	71.59	2.41	15.29	1.48	0.66	0.069
<i>Sargassum</i> ...	11.72	61.63	0.17	26.48	1.02	5.99	0.21
<i>Turbinaria</i> ...	6.13	63.07	0.50	30.30	0.96	9.11	0.27

† With the kind permission of the Director of Industries and Commerce, Madras.

\* The jurisdiction of each yard extends to 5 miles on other side of the yards, along the Coast.

The sea-weeds are applied as manure in the dried state in Ramnad District for the Coconut plantations in the following manner. A circular pit is dug round the palm at a distance of 3 — 4 ft. from it and to a depth of 2 ft. The dried sea-weeds are put into the pit and covered with earth. The yield of trees manured in this manner is comparatively very good.

Besides the application of sea-weeds as such for the plantations it was suggested that a compost can be prepared by mixing sea-weeds, fish-offal and shark-liver-sediment. A series of experiments is being conducted at Krusadai Biological Station and the results of the first two experiments are given below:—

**Raw-materials:** The raw-materials used are sea-weeds, fish-offal and shark-liver sediment. The sea-weeds belonging to the three above mentioned genera that are washed on the shores of Krusadai in plenty are gathered and air dried. Fish-offal is collected from important fishing centres like *Thangachimadam*, *Karsapad* etc., close by and from the Smoked-Fish Supply Centre at *Attankarai*. The sediment of liver, remaining after the extraction of shark liver oil, is procured from the adjacent oil-extraction centres.

**Method of preparation of the Compost Manure:** A pit 4' deep with sloping sides is dug and it measures  $4\frac{1}{2}'$  x  $4\frac{1}{2}'$  at the top and 4' x 4' at the bottom. Dried casurina needles and palmyra leaves were spread at the bottom and the sides to prevent the admixture of the sand with the compost. In the first experiment the sea-weeds, fish-offal and liver-sediment are mixed in the proportion of 15 : 3 : 4, i. e., 120 lbs of sea-weeds, 24 lbs. of fish-offal and 32 lbs. of liver-sediment were used. This is covered with palmyra leaf and over that with sand. The period given for the formation of the compost was from 30—11—1944 to 3—2—1945, i. e., a period of 3 months. A sample of this was analysed by the Agricultural Chemist, Coimbatore and the analysis shows that the nitrogen content is 2.66%, phosphoric acid 0.366% and potash 3.47%. This has been certified to be of a "quality much above the average".

The same system of compost preparation is followed in the second experiment except that the proportion is a little varied and the period given for the formation of the compost is reduced to  $2\frac{1}{2}$  months. The proportion of sea-weeds to fish-offal and liver sediment is 20 : 4 : 3, i. e., 310 lbs. of sea-weeds, 64 lbs. of

fish-offal and 48 lbs. of liver-sediment. The analysis indicates that the nitrogen content and potash content are comparatively lower than in the 1st sample whereas the phosphoric acid content is higher. The following table gives the results of the analysis of the two samples:—

Compost Expt.	Moisture	Loss on Ignition	Ash	Insoluble	Nitrogen	Phos-phoric acid	Potash
I	10.07%	44.53%	45.40%	3.07%	2.366%	0.66%	3.47%
II	5.87%	50.52%	43.64%	7.58%	1.24%	1.45%	2.00%

The second sample is of average quality.

Further experiments on variations in the manurial value of the compost by changing the proportions of the raw-materials, period of compost formation, in different seasons of the year and with different species of sea-weeds etc., are being conducted at Krusadai Biological Station. It is up to the officers of the Agricultural Department to suggest the proportion of the sea-weeds and compost for application as manure for different crops at different places in different seasons.

**Resume:** (1) Three sea-weeds, *Gracillaria*, *Sargassum* and *Turbinaria sp* have been analysed for their manurial value.

(2) The sea-weeds, *Sargassum* and *Turbinaria* are fairly rich in potash.

(3) The three varieties of sea-weeds contain fair quantities of nitrogen.

(4) The result of the compost formed with sea-weeds, fish-offal and liver-sediment in the proportion of 15 : 3 : 4 in 3 months during the rainy season shows that the manure is of a superior quality.

(5) The compost prepared in the proportion of 20 : 4 : 3 in 2½ months during the hot season is of average quality.

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